

claim the subject matter that the applicant regards as the invention. More particularly, the Examiner asserts that the recitation of "cationic conditions or combinations thereof" is not understood since it is not known what "combinations" refer to. For the following reasons, this rejection is respectfully traversed.

With respect to claims 1 and 22, "combinations thereof" refers to the polymer being a combination of various polymers. Additionally, the reference to "under cationic conditions" directly refers to the amphoteric polymer; therefore, there are three different types of polymers set forth in claim 1. Thus, the "combinations thereof" refers to two or more different types of these three polymers. As such, for the reasons set forth above, claims 1 and 22 satisfy all requirements of §112. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. §112 be withdrawn.

In the Office Action, at page 2, the Examiner rejects claims 1, 4-13, and 16-22 under 35 U.S.C. §103(a) as being unpatentable over Smith (U.S. Patent No. 5,221,435) taken in view of Braitberg (U.S. Patent No. 3,234,075) or Bugosh (U.S. Patent No. 2,917,426). The Examiner asserts that Smith shows a method of improving retention in papermaking by adding a cationic polymer coagulant, which includes cationic polyacrylamide. Furthermore, the Examiner asserts that Smith shows a cationic alumina microparticle that is employed in conjunction with an anionic polymer retention aid. The Examiner then asserts that Braitberg teaches the addition of boehmite, which is a cationic fibrous alumina microparticle, to flocculate pitch particles. Furthermore, the Examiner asserts that, in Braitberg, the boehmite attaches and retains these components of the papermaking furnish to the pulp fibers. The Examiner also asserts that, alternatively, Bugosh teaches that boehmite microparticles, added to pulp slurry containing fillers and binders, synergistically improve binding, and thus filler retention is likewise improved.

Thus, in view of the above, the Examiner concludes that it would be obvious to use boehmite as the cationic aluminum microparticle in Smith. With regard to the apparatus claims 17-21, the Examiner asserts that these claims are for a standard apparatus used for papermaking and that the only difference is the use of the particular additives. The Examiner further asserts that the only difference is the additives which do not impart any structural difference to the apparatus already disclosed by Smith. For the following reasons, this rejection is respectfully traversed.

With respect to Smith, this patent relates to a paper product formed from a mineral filler containing cellulosic slurry. Retention performance in Smith is provided by the sequential addition of cationic charge-biasing species and anionic flocculant, and then by the addition of a certain microparticle. This process requires the shear stage to be interposed between the flocculation addition and the microparticle, which is an inorganic cationic source of aluminum. The cationic charge-biasing species in Smith are cationic polymers, such as cationic nitrogen polymers and acrylamide. There is no teaching or suggestion in Smith of using fibrous cationic colloidal alumina microparticles or the use of nonionic polymers. There is also no teaching or suggestion in Smith of sols or problems associated with microparticle sols in a papermaking process.

With respect to Braitberg, this patent relates to an effective method and composition for the control of slimes generally and pitch particularly, in the recirculating water of pulp and paper mills. The agent used in Braitberg for controlling slimes in an aqueous media is a cationic colloidal alumina in fibrous form. Controlling pitch and the retention of paper-pulp fines are two different techniques, and not easily combinable. It is unlikely one skilled in the art would combine Braitberg with Smith for this reason. In column 2 of Braitberg, the patent does mention that the use of alum in paper mill waters tends to precipitate the pitch in sticky agglomerated

form that constitutes a more troublesome slime than the original pitch itself. This is not the same as paper making as shown in Smith. Braitberg adds a cationic colloidal fibrous alumina in macromolecular form to the aqueous media. Also, there is no teaching or suggestion in Braitberg of using cationic or nonionic polymers in combination with fibrous cationic colloidal alumina microparticles to form a stable microparticle sol retention aid for use in a papermaking process.

Also, Braitberg does mention that the fibrous colloidal alumina monohydrates are added prior to the pulp in order to form a floc, which then attaches onto the pulp. Since the main purpose of Braitberg is to flocculate the pitch and other impurities in the pulp water as a result of slime, one skilled in the art would not be motivated to add any other ingredients that may interfere with this control of slime prior to being mixed with pulp. Accordingly, one skilled in the art would not look to Braitberg for any solutions or substitutions in view of Smith. In other words, one skilled in the art would not use any of the cationic fibrous material in Smith because Smith does not teach or suggest the use of any fibrous material. Furthermore, Braitberg relates to controlling slime prior to being mixed with pulp and Smith specifically relates to using polymers with certain types of microparticles in making paper. The two patents are not related and in fact relate to solving different problems.

With respect to Bugosh, this patent relates to felted products and to processes for preparing the same. Bugosh uses fibrous alumina monohydrates to make a useful binder for felted products having a variety of useful and superior properties. As with Braitberg, Bugosh does not relate to stable microparticle sol retention aid for use in papermaking processes. Furthermore, there is no teaching or suggestion in Bugosh of using cationic or nonionic polymers. Thus, one skilled in the art would not be motivated to combine Smith with Braitberg or Bugosh to make the claimed invention that uses a specific combination of polymer with

microparticle.

With respect to claims 17-21, Smith, Braitberg, or Bugosh do not teach or suggest the apparatus used in the paper making process of the claimed invention. In particular, contrary to the Examiner's position, claim 17 specifically recites a supply of fibrous cationic colloidal alumina microparticles, and a supply of retention system polymer and a device for feeding each component to pulp or treated pulp. Clearly, the cited references do not teach such an apparatus. As such, for the reasons set forth above, claims 1, 17, and 22 are patentable. Claims 4-13, 16, and 18-21 are dependent directly or indirectly on claims 1 and 17. Therefore, the reasons set forth above with respect to patentability of claims 1 and 17 would also apply here. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. §103(a) over Smith in view of Braitberg or Bugosh be withdrawn.

In the Office Action, at page 3, the Examiner rejects claims 2, 3, and 23 under 35 U.S.C. §103(a) as being unpatentable over Smith taken in view of Braitberg or Bugosh and further in view of Sippel (WO 97/41063). The Examiner asserts that it would have been obvious to employ the acetate salt of boehmite in view of the superior flocculating activity as taught by Sippel. For the following reasons, this rejection is respectfully traversed.

With respect to Sippel, this application relates to salt of boehmite alumina suitable for use in dyeing and purifying a waste stream or effluent. According to Sippel, placing a cationic fibrous acetate salt of boehmite alumina in contact with dye waste stream leads to flocculation or precipitation of the dyes without contamination of the stream with other ionic species. Sippel relates strictly to the use of cationic fibrous acetate salt in dyeing fabrics. Furthermore, as part of this dyeing, Sippel uses a salt of boehmite alumina in purifying a waste stream or effluent. Sippel has nothing to do with using the particular cationic fibrous acetate salt in papermaking nor

does Sippel teach or suggest the advantages achieved with using a cationic fibrous acetate salt with the various cationic or nonionic polymers as set forth in the claims of the present application. Sippel is non-analogous art because it does not relate to the particular technology area of the claimed invention. Thus, one would not even look to Sippel for any solutions with respect to the deficiencies of Smith, Bugosh, or Braitberg. Furthermore, claims 2, 3, and 23 are dependent directly on claims 1 and 22. Therefore, the reasons set forth above with respect to patentability of those claims would also apply here. Thus, the combination of Smith, Braitberg, Bugosh, and Sippel would not teach or suggest the claimed invention nor show the advantages and benefits achieved by the claimed invention. As such, for the reasons set forth above, claims 2, 3, and 23 are patentable. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. §103(a) over Smith in view of Sippel, Braitberg, or Bugosh be withdrawn.

In the Office Action, at page 3, the Examiner rejects claims 14 and 15 under 35 U.S.C. §103(a) as being unpatentable over Smith, in view of Braitberg or Bugosh and further in view of Sarkar et al. (U.S. Patent No. 5,169,497) or Sarkar et al. (U.S. Patent No. 5,507,914). The Examiner asserts that it would have been obvious to add a cellulase enzyme to the pulp furnish since it advantageously improves the freeness of the pulp furnish as taught by Sarkar et al. '497 and '914. For the following reasons, this rejection is respectfully traversed.

With respect to Sarkar et al. '497, this patent relates to the process for improving freeness of paper pulp by adding to the pulp a cellulolytic enzyme, allowing the pulp to contact the cellulolytic enzyme for at least twenty minutes, and adding a water-soluble cationic polymer to form the treated pulp into paper. There is no teaching or suggestion in Sarkar et al. '497 of using the fibrous cationic colloidal alumina microparticles as recited in claim 1.

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With respect to Sarkar et al. '914, this patent is very similar to Sarkar et al. '497 in that the purpose of the invention is to enhance the freeness of paper pulp by adding a cellulolytic enzyme in a vertical tank to the paper-making process, allowing the pulp to contact cellulolytic enzyme, adding a water-soluble cationic polymer, and forming the pulp into paper. Furthermore, Sarkar et al. '914 makes use of a water-soluble anionic polymer after the addition of the water-soluble cationic polymer. Since claims 14 and 15 are dependent directly on claim 1, the reasons set forth above with respect to patentability of claim 1 would also apply here. Therefore, the combination of Smith, Braitberg, Bugosh, and Sarkar et al. '497 and/or '419 would not teach or suggest the claimed invention nor show the advantages and benefits achieved by the claimed invention. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. §103(a) over Smith in view of Sarkar et al. '497 or '419, Braitberg, or Bugosh be withdrawn.

If there are any remaining questions, the Examiner is encouraged to contact the undersigned by telephone.

CONCLUSION

In view of the following remarks, the applicants respectfully request consideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 50-0925. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,


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